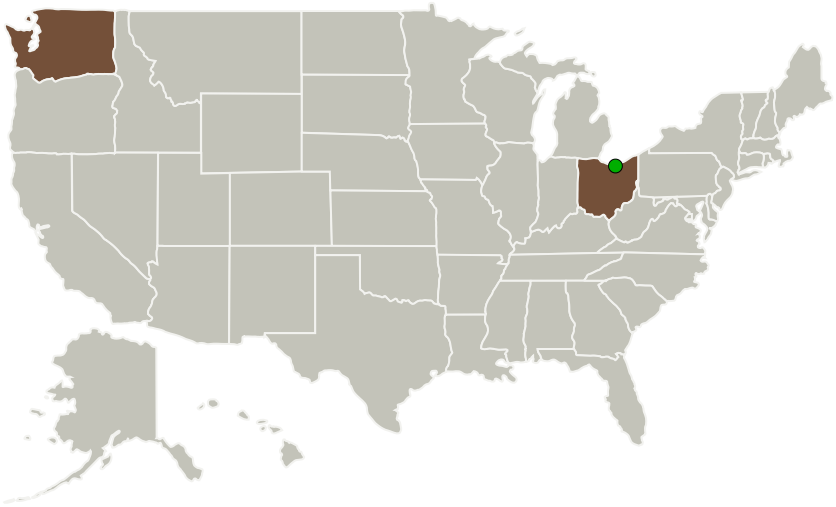
Modular Stirling Power System (MSPS), Phase I

Completed Technology Project (2012 - 2012)

Project Introduction

Infinia Technology Corporation's (ITC) proposed Modular Stirling Power System (MSPS) is a free-piston Stirling system that addresses NASA needs in 12-kW increments. The MSPS utilizes a support structure that couples 1 heater head with 4 power modules and provides a high efficiency of 25% between very conservative acceptor and rejecter temperatures of 823 K and 475 K (30% @ 900/450 K). Proven ITC technology provides high intrinsic reliability and maintenance-free operation for >15 years. It directly leverages 3-kW power modules developed for Infinia's solar-Stirling PowerDish™ that have been deployed in over 400 engines to enable full-scale demonstration under a Phase II SBIR. The MSPS will employ innovative fabrication and/or laser welding processes for reliable liquid metal pumped loop compatibility with a next-generation heater head designed for nuclear system integration. Phase I will culminate in a concept definition and design as a foundation for analysis, detailed design, fabrication, and testing in Phase II. Development of the MSPS concept opens many avenues of application for commercial and government markets. Within NASA, the system will provide mission support for future space transportation and surface power with a very reliable, high-efficiency Stirling converter for the conversion of reactor heat into electricity.

Primary U.S. Work Locations and Key Partners



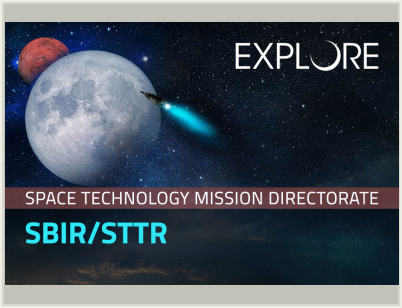


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Table of Contents

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Organizations Performing Work	Role	Type	Location
Infinia Technology Corporation	Lead Organization	Industry	Kennewick, Washington
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
Ohio	Washington

Project Transitions

February 2012: Project Start

August 2012: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138325)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Infinia Technology Corporation

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

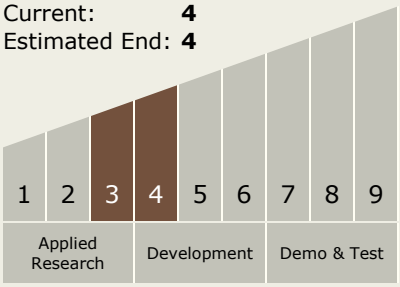
Carlos Torrez

Principal Investigator:

Songgang Qiu

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.3 Power Management and Distribution
    - TX03.3.3 Electrical Power Conversion and Regulation

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System